

1 CLAIMS:

2  
3 1. A microelectronic device fabricating method comprising:  
4 providing a substrate having at least one beveled portion;  
5 forming a layer of structural material on at least the at least  
6 one beveled portion; and

7 removing at least a portion of the structural material from the  
8 at least one beveled portion by anisotropic etching to form a device  
9 feature from the structural material.  
10

11 2. The method of claim 1, wherein the substrate comprises a  
12 layer of insulative material over a semiconductive wafer, the structural  
13 material being formed over the insulative material.  
14

15 3. The method of claim 1, wherein the bevel is less than or  
16 equal to about 45°.  
17

18 4. The method of claim 1, wherein the substrate comprises a  
19 raised mandril and a semiconductive wafer, the raised mandril being  
20 positioned over the wafer and having four edges, including two edges  
21 substantially perpendicular to the wafer and two beveled edges, the  
22 structural material being formed over at least one beveled edge.  
23

1           5.     The method of claim 1, wherein the forming of structural  
2 material comprises depositing a substantially uniformly thick layer of  
3 structural material over the substrate.

4  
5           6.     The method of claim 1, wherein the structural material  
6 comprises a chemical reaction or diffusion barrier material.

7  
8           7.     The method of claim 6, wherein the barrier material  
9 comprises a metal comprising oxide or metal comprising nitride.

10  
11          8.     The method of claim 1, wherein the removing of structural  
12 material comprises removing only a portion of the structural material  
13 from the at least one beveled portion to leave a pair of spaced,  
14 adjacent structural material lines on the at least one beveled portion.

15  
16          9.     The method of claim 1, wherein the device feature  
17 comprises a pair of spaced, adjacent, chemical reaction or diffusion  
18 barrier material lines which are substantially void of residual shorting  
19 stringers extending therebetween.

10. The method of claim 1, wherein the removing of structural material comprises removing substantially all of the structural material from the at least one beveled portion but leaving at least a portion of the structural material on another portion of the substrate.

11. The method of claim 10, wherein the structural material is conductive.

12. The method of claim 1, wherein the device feature comprises an edge defined feature.

13. A microelectronic device fabricating method comprising:  
providing a substrate having at least one beveled portion;  
forming a layer of structural material on the substrate, including  
on the at least one beveled portion; and  
removing only a portion of the structural material from the at  
least one beveled portion by anisotropic etching to form a device  
feature from the structural material on the at least one beveled  
portion.

14. The method of claim 13, wherein the substrate comprises  
a layer of insulative material over a semiconductive wafer, the  
structural material being formed over the insulative material.

15. The method of claim 13, wherein the bevel is less than or  
equal to about 45°.

16. The method of claim 13, wherein the forming of structural  
material comprises depositing a substantially uniformly thick layer of  
structural material over the substrate.

17. The method of claim 13, wherein the structural material  
comprises a chemical reaction or diffusion barrier material.

1 18. The method of claim 13, wherein the device feature  
2 comprises a pair of spaced, adjacent lines on the at least one beveled  
3 portion.

4  
5 19. The method of claim 13, wherein the device feature  
6 comprises a pair of spaced, adjacent, chemical reaction or diffusion  
7 barrier material lines which are substantially void of residual shorting  
8 stringers extending therebetween.  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

1           20. A microelectronic device fabricating method comprising:  
2           providing a substrate having at least one beveled portion,  
3           wherein the bevel is less than or equal to about 45°;  
4           forming a layer of chemical reaction or diffusion barrier material  
5           over the substrate, including over the at least one beveled portion;  
6           forming a resist mask pattern over the barrier material; and  
7           with the mask pattern in place, anisotropically etching to form a  
8           pair of spaced, adjacent barrier material lines which are substantially  
9           void of residual shorting stringers extending therebetween.

10  
11           21. The method of claim 20, wherein the substrate comprises  
12           a layer of insulative material over a semiconductive wafer, the barrier  
13           material being formed over the insulative material.

14  
15           22. The method of claim 20, wherein the forming of structural  
16           material comprises depositing a substantially uniformly thick layer of  
17           structural material over the substrate.

18  
19           23. The method of claim 20, wherein the barrier material  
20           comprises a metal comprising oxide or metal comprising nitride.  
21  
22  
23

1           24. A microelectronic device fabricating method comprising:  
2           providing a substrate with a base surface and a raised surface,  
3           the raised surface being raised out from the base surface and having  
4           at least one edge substantially perpendicular to the base surface and  
5           at least one beveled edge;  
6           forming a layer of structural material on at least the at least  
7           one perpendicular edge and the at least one beveled edge; and  
8           removing an effective amount of the structural material from the  
9           at least one beveled edge, the base surface, and the raised surface  
10          while leaving an effective amount of the structural material on the  
11          perpendicular edge to form an edge defined feature from the  
12          structural material on at least the at least one perpendicular edge.

13  
14          25. The method of claim 24, wherein the substrate comprises  
15          a layer of insulative material over a semiconductive wafer, the  
16          structural material being formed over the insulative material.

17  
18          26. The method of claim 24, wherein the bevel is less than or  
19          equal to about 45°.  
20  
21  
22  
23

1           27. The method of claim 24, wherein the raised surface  
2 comprises a mandril and the base surface comprises a semiconductive  
3 wafer, the mandril being positioned over the wafer and having four  
4 edges, including two edges substantially perpendicular to the wafer and  
5 two beveled edges.

6  
7           28. The method of claim 24, wherein the forming of structural  
8 material comprises depositing a substantially uniformly thick layer of  
9 structural material over the substrate.

10  
11           29. The method of claim 24, wherein the removing of  
12 structural material comprises removing substantially all of the structural  
13 material from the at least one beveled edge but leaving at least a  
14 portion of the structural material on the at least one perpendicular  
15 edge of the substrate.

16  
17           30. The method of claim 29, wherein the structural material is  
18 conductive.

19  
20           31. The method of claim 24, wherein the device feature  
21 comprises an edge defined feature.  
22  
23



1 32. A microelectronic device fabricating method comprising:  
2 providing a raised mandril over a substrate, the raised mandril  
3 being raised out from the substrate and having at least one edge  
4 substantially perpendicular to the substrate and at least one beveled  
5 edge;

6 forming a layer of conductive material on at least the at least  
7 one perpendicular edge and the at least one beveled edge;

8 anisotropically etching an effective amount of the conductive  
9 material from the at least one beveled edge, the substrate, and the  
10 mandril while leaving an effective amount of the conductive material  
11 on the perpendicular edge to form an edge defined feature from the  
12 conductive material on the at least one perpendicular edge; and

13 removing substantially all of the mandril.  
14

15 33. The method of claim 32, wherein the substrate comprises  
16 a layer of insulative material over a semiconductive wafer, the  
17 conductive material being formed over the insulative material.  
18

19 34. The method of claim 32, wherein the bevel is less than or  
20 equal to about 45°.  
21  
22  
23

1           35. The method of claim 32, wherein the substrate comprises  
2 a semiconductive wafer, the raised mandril being positioned over the  
3 wafer and having four edges, including two edges substantially  
4 perpendicular to the wafer and two beveled edges.

5  
6           36. The method of claim 32, wherein the forming of  
7 conductive material comprises depositing a substantially uniformly thick  
8 layer of conductive material over the substrate.  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

1 37. A microelectronic device fabricating method comprising:  
2 forming a resist mask pattern on a substrate, the resist pattern  
3 having at least one beveled portion at an edge of at least one  
4 opening in the resist pattern;  
5 transferring the resist pattern to the substrate to form at least  
6 one beveled portion of the substrate;  
7 forming a layer of structural material on at least the at least  
8 one beveled portion of the substrate; and  
9 removing at least a portion of the structural material from the  
10 at least one beveled portion by anisotropic etching to form a device  
11 feature from the structural material.

12  
13 38. The method of claim 37, wherein the substrate comprises  
14 a layer of insulative material over a semiconductive wafer, the  
15 structural material being formed over the insulative material.

16  
17 39. The method of claim 37, wherein the bevel is less than or  
18 equal to about 45°.

1           40.    The method of claim 37, wherein the transferring the  
2 resist pattern forms a raised mandril from the substrate, the mandril  
3 having four edges, including two edges substantially perpendicular to a  
4 recessed portion of the substrate and two beveled edges, the structural  
5 material being formed over at least one beveled edge.

6  
7           41.    The method of claim 37, wherein the forming of structural  
8 material comprises depositing a substantially uniformly thick layer of  
9 structural material over the substrate.

10  
11           42.    The method of claim 37, wherein the structural material  
12 comprises a chemical reaction or diffusion barrier material.

13  
14           43.    The method of claim 42, wherein the barrier material  
15 comprises a metal comprising oxide or metal comprising nitride.

16  
17           44.    The method of claim 37, wherein the removing of  
18 structural material comprises removing only a portion of the structural  
19 material from the at least one beveled portion to leave a pair of  
20 spaced, adjacent structural material lines on the at least one beveled  
21 portion.

1           45.    The method of claim 37, wherein the device feature  
2 comprises a pair of spaced, adjacent, chemical reaction or diffusion  
3 barrier material lines which are substantially void of residual shorting  
4 stringers extending therebetween.

5  
6           46.    The method of claim 37, wherein the removing of  
7 structural material comprises removing substantially all of the structural  
8 material from the at least one beveled portion but leaving at least a  
9 portion of the structural material on another portion of the substrate.

10  
11           47.    The method of claim 46, wherein the structural material is  
12 conductive.

13  
14           48.    The method of claim 37, wherein the device feature  
15 comprises an edge defined feature.  
16  
17  
18  
19  
20  
21  
22  
23

49. A microelectronic device fabricating method comprising:  
providing a layer of resist material on a substrate;  
exposing the resist to actinic energy providing gradated exposure  
of a second resist region;  
developing the resist to remove a first region, revealing the  
substrate, and a portion of the second region, without revealing the  
substrate, while leaving a third region in place to form a resist mask  
pattern on the substrate, wherein a beveled portion of the resist  
pattern forms in the second region;  
transferring the resist pattern to the substrate to form at least  
one beveled portion of the substrate;  
forming a layer of structural material on at least the at least  
one beveled portion of the substrate; and  
removing at least a portion of the structural material from the  
at least one beveled portion by anisotropic etching to form a device  
feature from the structural material.

50. The method of claim 49, wherein the substrate comprises  
a layer of insulative material over a semiconductive wafer, the  
structural material being formed over the insulative material.

1           51. The method of claim 49, wherein the bevel is less than or  
2 equal to about 45°.

3  
4           52. The method of claim 49, wherein the transferring the  
5 resist pattern forms a raised mandril from the substrate, the mandril  
6 having four edges, including two edges substantially perpendicular to a  
7 recessed portion of the substrate and two beveled edges, the structural  
8 material being formed over at least one beveled edge.

9  
10          53. The method of claim 49, wherein the forming of structural  
11 material comprises depositing a substantially uniformly thick layer of  
12 structural material over the substrate.

13  
14          54. The method of claim 49, wherein the structural material  
15 comprises a chemical reaction or diffusion barrier material.

16  
17          55. The method of claim 54, wherein the barrier material  
18 comprises a metal comprising oxide or metal comprising nitride.  
19  
20  
21  
22  
23

1           56. The method of claim 49, wherein the removing of  
2 structural material comprises removing only a portion of the structural  
3 material from the at least one beveled portion to leave a pair of  
4 spaced, adjacent structural material lines on the at least one beveled  
5 portion.

6  
7           57. The method of claim 49, wherein the device feature  
8 comprises a pair of spaced, adjacent, chemical reaction or diffusion  
9 barrier material lines which are substantially void of residual shorting  
10 stringers extending therebetween.

11  
12           58. The method of claim 49, wherein the removing of  
13 structural material comprises removing substantially all of the structural  
14 material from the at least one beveled portion but leaving at least a  
15 portion of the structural material on another portion of the substrate.

16  
17           59. The method of claim 58, wherein the structural material is  
18 conductive.

19  
20           60. The method of claim 49, wherein the device feature  
21 comprises an edge defined feature.  
22  
23





1 64. An intermediate construction of an integrated circuit  
2 comprising:  
3 a) a semiconductive substrate;  
4 b) a raised mandril over the substrate, the raised mandril being  
5 raised out from the substrate and having at least one edge  
6 substantially perpendicular to the substrate and at least one beveled  
7 edge; and  
8 c) a layer of structural material forming an edge defined feature  
9 on the at least one perpendicular edge.  
10

11 65. The method of claim 64, wherein the bevel is less than or  
12 equal to about 45°.  
13

14 66. The method of claim 64, wherein the raised mandril  
15 comprises four edges, including two edges substantially perpendicular  
16 to the substrate and two beveled edges.  
17

18 67. The method of claim 64, wherein the structural material is  
19 conductive.  
20  
21  
22  
23